

REMARKS

Reconsideration of this application is respectfully requested in view of the foregoing amendment and the following remarks. By this amendment, claims 1-5 and 10 have been cancelled, and claims 6, 8, and 11-12 have been amended. Thus, claims 6-9 and 11-12 are currently pending in the application and subject to examination.

In the Office Action mailed September 9, 2004, the specification was objected to. By this Response, the specification has been amended in accordance with the Examiner's suggestions. In particular, page 15, line 23 has been amended to replace the term "discharge valve 36" with "discharge pipe 36." If any further action is necessary to overcome this objection, the Examiner is respectfully requested to contact the undersigned representative.

In the Office Action mailed September 9, 2004, claims 1-12 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,692,402 to Nakamori et al. (Nakamori). The cancellation of Claims 1-5 and 10 renders moot the rejection of these claims.

The rejection of the claims was discussed in an interview with the Examiner on November 19, 2004. The Applicants appreciate the courtesy shown by the Examiner in granting an interview to the Applicants' representative.

During the interview, the cited art reference U.S. Patent No. 6,692,402 to Nakamori et al. and the differences between the present invention and the cited art were discussed. Furthermore, proposed claim amendments to overcome the outstanding rejections were discussed.

During the interview, the Examiner agreed methods of controlling the engine based on current through a driving motor, driving voltage, duty ratio, or slip ratio are not disclosed in the prior art. The Examiner also suggested alternate claim language for claims 6, 8, and 11, to highlight the differences between the present invention and the prior art. By this Response, claims 6, 8, and 11 have been amended in accordance with the Examiner's suggestions.

Nakamori teaches a drive control apparatus for driving an electrical oil pump by supplying it with a predetermined operating voltage. In operation, as shown in Fig. 6, the control apparatus determines whether a driving source stopping flag is on. The driving source stopping flag indicates that both the engine and the motor are off. When the engine, the motor, or both are on, the driving source stopping flag is off, and it is determined whether the clutch hydraulic pressure is sufficient. Determining whether the clutch hydraulic pressure is sufficient includes, for example, determining whether the clutch hydraulic pressure is greater than or equal to a predetermined value; or determining whether the driving power source rotational speed is greater than or equal to a predetermined value. If the clutch hydraulic pressure is sufficient, the electric oil pump is stopped. If the clutch hydraulic pressure is not sufficient, the oil temperature is detected, and an operating voltage is supplied to the electric pump based on the oil temperature.

The Applicants note that Nakamori teaches only methods for operating the electric pump depending on the state of the driving source stopping flag. Nakamori does not teach methods for operating the engine. Furthermore, Nakamori teaches only

methods for operation based on a measured value of clutch hydraulic pressure or driving power source rotational speed. Nakamori does not teach or suggest operation based on current through a driving motor, driving voltage, duty ratio, or slip ratio.

Amended claim 6 is directed to an engine stop and start control system for a vehicle, wherein the vehicle comprises an engine as a power source for driving the vehicle, a transmission for transmitting power produced by the engine to an output shaft of the vehicle, and a mechanical oil pump, operated by the power produced by the engine, for supplying oil pressure to the transmission. The control system comprises: an automatic engine stopping and starting section automatically stopping the engine under predetermined stopping conditions, automatically starting the engine under predetermined starting conditions, and restarting the engine when a value of current flowing through a driving motor for driving an electric oil pump is out of a predetermined range while the engine is automatically stopped, wherein the electric oil pump is operated when the predetermined stopping conditions are satisfied, so as to supply the oil pressure to the transmission.

As discussed above, Nakamori discloses only systems and methods for operating an electric pump based on a measured value of clutch hydraulic pressure or driving power source rotational speed. Nakamori does not teach or suggest a method for operating the engine based on the current flowing through a driving motor. Accordingly, Nakamori does not teach or suggest “restarting the engine when a value of current flowing through a driving motor for driving an electric oil pump is out of a predetermined range while the engine is automatically stopped,” as recited in amended claim 6. Accordingly, claim 6 is patentable over the art of record.

Amended claim 8 is directed to an engine stop and start control system for a vehicle, wherein the vehicle comprises an engine as a power source for driving the vehicle, a transmission for transmitting power produced by the engine to an output shaft of the vehicle, and a mechanical oil pump, operated by the power produced by the engine, for supplying oil pressure to the transmission. The control system comprises an automatic engine stopping and starting section automatically stopping the engine under predetermined stopping conditions, automatically starting the engine under predetermined starting conditions, and restarting the engine when one of a driving voltage and a duty ratio in pulse width modulation of a driving motor for driving an electric oil pump is equal to or greater than a predetermined value while the engine is automatically stopped, wherein the electric oil pump is operated when the predetermined stopping conditions are satisfied, so as to supply the oil pressure to the transmission via an oil pressure supply section, where one of the driving voltage and the duty is controlled in a manner such that one of a line pressure, which is the oil pressure in the oil pressure supply section, and a value of current flowing through the driving motor coincides with a predetermined command value.

As discussed above, Nakamori discloses only systems and methods for operating an electric pump based on a measured value of clutch hydraulic pressure or driving power source rotational speed. Nakamori does not teach or suggest a method for operating the engine based on the duty voltage or duty ratio of a driving motor. Accordingly, Nakamori does not teach or suggest “restarting the engine when one of a driving voltage and a duty ratio in pulse width modulation of a driving motor for driving an electric oil pump is equal to or greater than a predetermined value while the engine

is automatically stopped," as recited in amended claim 8. Accordingly, claim 8 is patentable over the art of record.

Amended claim 11 is directed to an engine stop and start control system for a vehicle, wherein the vehicle comprises an engine as a power source for driving the vehicle, a transmission for transmitting power produced by the engine to an output shaft of the vehicle, and a mechanical oil pump, operated by the power produced by the engine, for supplying oil pressure to the transmission. The control system comprises an automatic engine stopping and starting section automatically stopping the engine under predetermined stopping conditions, automatically starting the engine under predetermined starting conditions, and prohibiting the automatic engine stop when a slip ratio of a clutch for a gear for starting the vehicle in the transmission exceeds a predetermined range in a predetermined time after the engine is restarted from the state in which the engine is automatically stopped, and an electric oil pump operated when the predetermined stopping conditions are satisfied, so as to supply the oil pressure to the transmission.

As discussed above, Nakamori discloses only systems and methods for operating an electric pump based on a measured value of clutch hydraulic pressure or driving power source rotational speed. Nakamori does not teach or suggest a method for operating the engine based on a slip ratio. Accordingly, Nakamori does not teach or suggest "prohibiting the automatic engine stop when a slip ratio of a clutch for a gear for starting the vehicle in the transmission exceeds a predetermined range in a predetermined time after the engine is restarted from the state in which the engine is

automatically stopped," as recited in amended claim 11. Accordingly, claim 11 is patentable over the art of record.

Claims 7, 9, and 12 are dependent claims that depend on independent claims 6, 8, and 11. As claims 6, 8, and 11 are patentable over the cited art, so dependent claims 7, 9, and 12 are patentable over the cited art.

For all of the above reasons, it is respectfully submitted that the claims now pending patentability distinguish the present invention from the cited references. Accordingly, reconsideration and withdrawal of the outstanding rejection and an issuance of a Notice of Allowance are earnestly solicited.

Should the Examiner determine that any further action is necessary to place this application into better form, the Examiner is encouraged to telephone the undersigned representative at the number listed below.

In the event this paper is not considered to be timely filed, the Applicants hereby petition for an appropriate extension of time. The Commissioner is hereby authorized to charge any fee deficiency or credit any overpayment associated with this communication to Deposit Account No. 01-2300, referencing Attorney Docket No. 108397-00082.

Respectfully submitted,

Arent Fox, PLLC



Sarah E. Stahnke
Agent for Applicants
Registration No. 54,854

Customer No. 004372
1050 Connecticut Ave., N.W.
Suite 400
Washington, D.C. 20036-5339
Telephone No. (202) 828-3428
Facsimile No. (202) 638-4810

SES:RJH/vrb